# Docklight Application Note: Docklight RS232 Adapter

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## 1 Docklight RS232 Adapter

Docklight RS232 Adapter is a USB-to-RS232 adapter cable for standard RS232 communication using Docklight or Docklight Scripting. It guarantees trouble-free operation on all *Windows* versions currently supported by the Docklight software applications.

The Docklight RS232 Adapter is capable of communication rates from 300 Baud to 1 MBaud. It adds one RS232 / serial COM port by connecting to the USB. The industry standard FTDI chipset and device drivers are supported by *Windows Update* and ensure maximum compatibility.

For technical data and dimensions see our Docklight RS232 Adapter Product Information Sheet [2].

## 2 Quick Start

1. Make sure you have installed the latest Docklight RS232 Adapter USB drivers (FTDI device drivers).

   On *Windows 7* and *Windows Vista* this is fully automatic – just plug in the Docklight RS232 Adapter and *Windows Update* will download and install the correct drivers, if required.

   For *Windows XP*, the drivers can be downloaded from the following link:
   http://www.docklight.de/download/Docklight_Tap_Drivers.zip
   For details see Section 4: Driver Installation.

2. Start Docklight V1.9 or Docklight Scripting V1.9, choose the menu **Tools > Project Settings...** and select **Communication Mode: Send/Receive**. At **Send/Receive on Comm.Channel,** choose the COM port that belongs to the Docklight RS232 Adapter, e.g. **COM4**

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TIP: The correct COM port to use (e.g. COM4) is shown when *Windows* performs the automatic driver installation (see Section 4: Driver Installation). But you can also find out using the *Windows* Device Manager: Use the *Windows* **Start** menu and type **Device Manager** in the search field: In the Device Manager dialog, check the section **Ports (COM & LPT)** for the **USB Serial Port** entry.

3. Review and adjust the **COM Port Settings** (baud rate, parity, …) in Docklight and confirm all settings with **OK**.

4. Press **Start Communication (F5)** in Docklight and start your test application.

# 3  Reference Configuration

We have tested the Docklight RS232 Adapter successfully using the following reference configuration:

- Fujitsu Lifebook T730 (Intel Core i3, 2.4 GHz, 4 GB RAM)

- *Windows 7* Professional, x64 Edition

- Docklight RS232 Adapter connected directly to built-in USB port, no USB hub used. No other USB device connected besides the Docklight RS232 Adapter and the pointing device (mouse).

- Docklight RS232 Adapter drivers installed, according to section 4 below.

- Docklight V1.9 or Docklight Scripting V1.9.

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# 4 Driver Installation

## 4.1 Windows 7 and Windows Vista (64 and 32 bit editions)

Driver download on Windows 7 and Windows Vista is fully automatic via Windows Update. After plugging in the Docklight RS232 Adapter, the device drivers are installed automatically, if required.
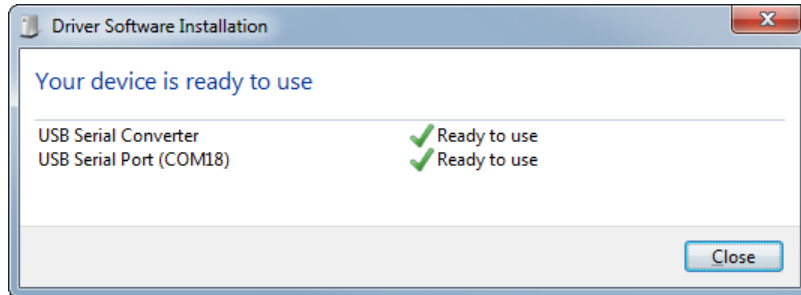


If in doubt, open the **Windows Device Manager** and make sure that both, the **USB Serial Port** (**COMxx)** and the **USB Serial Converter** device are appearing with correctly installed FTDI device drivers:
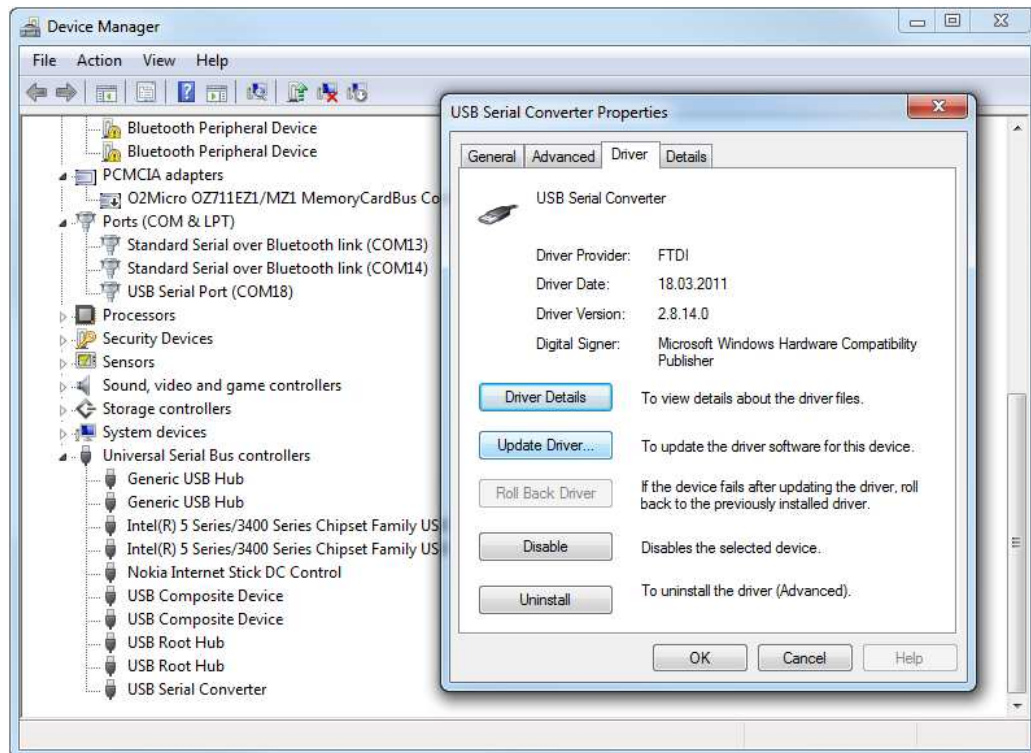


For additional instructions, please see the installation guides for the Docklight RS232 Adapter FTDI chipset, as available on the FTDI web site:

http://ftdichip.com/Documents/InstallGuides.htm

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## 4.2    Windows XP

1. Download the Docklight RS232 Adapter / FTDI USB device drivers from here:
   http://www.docklight.de/download/Docklight_Tap_Drivers.zip

2. Extract the contents of the .zip archive to a folder on your computer
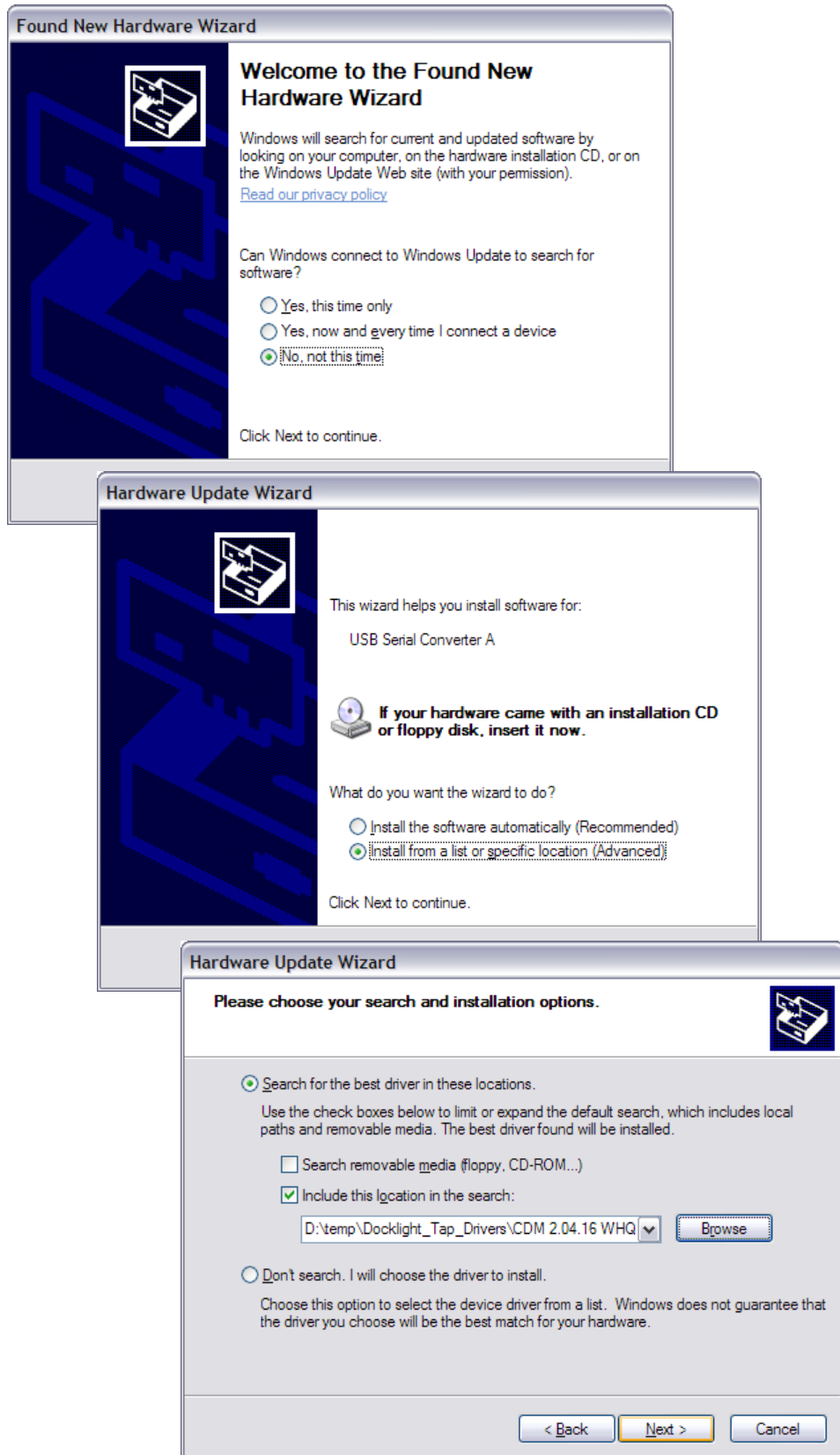


3. Connect the Docklight RS232 Adapter to your PC, and follow the Windows instructions for installing the drivers from the folder created above.

   For detailed instructions, please see the installation guides for the Docklight RS232 Adapter FTDI chipset, as available on the FTDI web site:

   http://ftdichip.com/Documents/InstallGuides.htm

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On *Windows XP*, the basic installation process can look like this:

**Found New Hardware Wizard**

### Welcome to the Found New Hardware Wizard

Windows will search for current and updated software by looking on your computer, on the hardware installation CD, or on the Windows Update Web site (with your permission).

Read our privacy policy

Can Windows connect to Windows Update to search for software?

○ Yes, this time only
○ Yes, now and every time I connect a device
⦿ No, not this time

Click Next to continue.

**Hardware Update Wizard**

This wizard helps you install software for:

USB Serial Converter A

If your hardware came with an installation CD or floppy disk, insert it now.

What do you want the wizard to do?

○ Install the software automatically (Recommended)
⦿ Install from a list or specific location (Advanced)

Click Next to continue.

**Hardware Update Wizard**

Please choose your search and installation options.

⦿ Search for the best driver in these locations.

Use the check boxes below to limit or expand the default search, which includes local paths and removable media. The best driver found will be installed.

☐ Search removable media (floppy, CD-ROM...)
☑ Include this location in the search:

D:\temp\Docklight_Tap_Drivers\CDM 2.04.16 WHQ ⌄   [Browse]

○ Don't search. I will choose the driver to install.

Choose this option to select the device driver from a list. Windows does not guarantee that the driver you choose will be the best match for your hardware.

[< Back]  [Next >]  [Cancel]

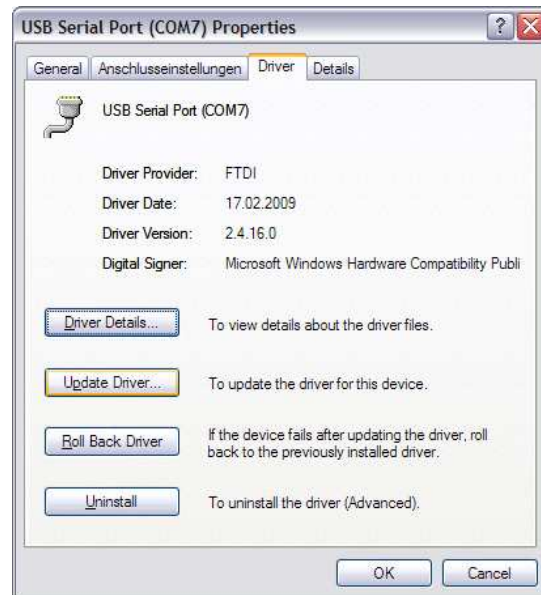| | | | | Date | 2011-12-23 | Docklight Application Note |
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Once the Docklight RS232 Adapter driver has been correctly installed, the Docklight RS232 Adapter will appear in the Windows **Device Manager** as follows:

Universal Serial Bus Controllers → **USB Serial Converter**

Ports (COM & LPT) → USB Serial Port, e.g. **USB Serial Port (COM7)**
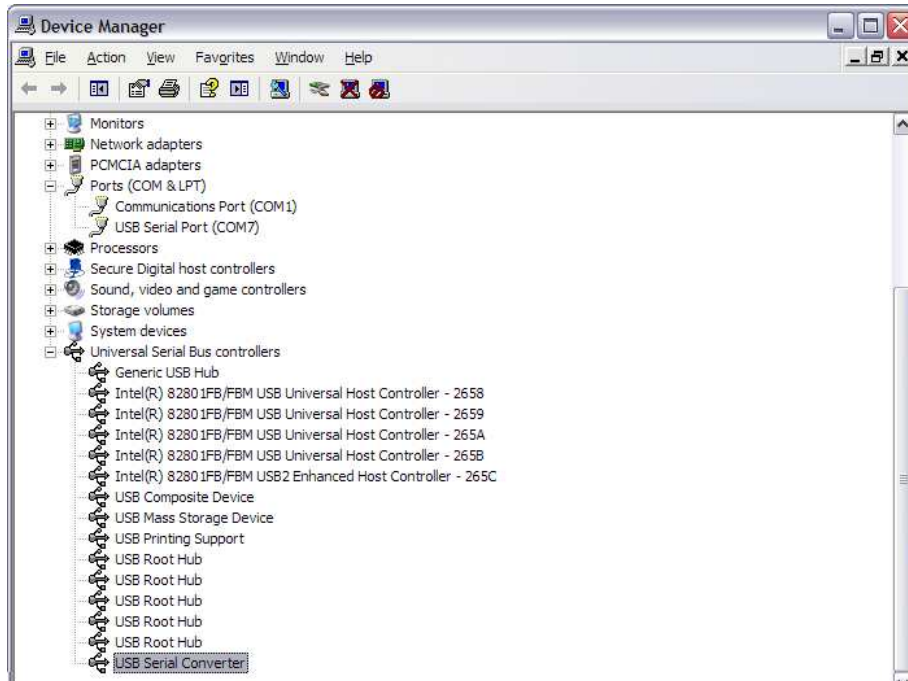


NOTE: There is a good chance that you already have FTDI bus and port drivers on your PC, and after connecting the Docklight RS232 Adapter, the drivers are installed fully automatic. In this case, check the driver version for both, **USB Serial Converter** and **USB Serial Port (COM7)**. Update the drivers, if necessary:



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# 5 Baud Rates

The Docklight RS232 Adapter supports a Baud Rate range from 300 Baud to 1 MBaud.

## 5.1 Non-Standard Baud Rates

Instead of choosing a standard baud rate from the dropdown list in the Docklight Settings dialog, you may directly type in an integer baud rate number. But non any integer baud rate can be achieved with the Doclight RS232 Adapter.

According to FTDI US232R datasheet [3], the following specification on non-standard baud rates applies:

"Achievable non-standard baud rates are calculated as follows:

Baud Rate = 3000000 / (n + x)

where n can be any integer between 2 and 16384, and x can be a sub-integer of the value

0, 0.125, 0.25, 0.375, 0.5, 0.625, 0.75, or 0.875.

When n = 1, x = 0, i.e. baud rate divisors with values between 1 and 2 are not possible.

This gives achievable baud rates in the range 183.1 baud to 3,000,000 baud. The US232R cable is limited to a maximum of 1 Mbaud because of the line driver within the circuit."

The related FTDI Application Note AN232B-05 [4] on Baud Rate Calculation states:

"The exact Baud rate may not be achievable - however as long as the actual Baud rate used is within +/- 3% of the required Baud rate then the link should function without errors. When a Baud rate is passed to the driver where the exact divisor required is not achievable, the closest possible Baud rate divisor will be used as long as that divisor gives a Baud rate which is within +/- 3% of the Baud rate originally set."

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# 7 References

[1]  Docklight V1.9 User Manual, from edition 04/2009,
     http://www.docklight.de/pdf/docklight_manual.pdf

[2]  Docklight RS232 Adapter Product Information Sheet
     http://www.docklight.de/pdf/Docklight_RS232_Adapter.pdf

[3]  FTDI Ltd document FT_000151: DS_US232R-10(R-100/500)
     USB to RS232 Adapter cable Data Sheet
     http://www.ftdichip.com/Support/Documents/DataSheets/Cables/DS_US232R-10_R-100-500.pdf

[4]  FTDI Ltd document AN232B-05: Configuring FT232R FT2232 and FT232B Baud Rates
     http://www.ftdichip.com/Documents/AppNotes/AN232B-05_BaudRates.pdf

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